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March 23, 2007

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RE: Department's Comments on Asarco's Design Analysis Report, CAMU Phase 2 Cell

Dear Ms. Jacobson;

The Montana Department of Environmental Quality (Department) received on January 18, 2007 the document titled *Design Analysis Report, Asarco East Helena, Corrective Action Management Unit (CAMU) Phase 2 Cell.* The Department provided comments to EPA in a letter dated February 14, 2007.

After February 14, 2007, the Department received additional documents from Asarco associated with the report. The documents included Appendix D, Appendix E, and Appendix G. The Department and EPA met with Asarco on March 6, 2007 regarding this project.

It is the Department's understanding that the Phase 2 CAMU is grandfathered (40 CFR 264.550) since EPA approved three CAMU cells prior to April 22, 2002. However, the approved waste was primarily soil. Since the waste to be placed in the Phase 2 CAMU is primarily demolition debris and the cell will remain open for several years, it is unclear whether the general scope of the CAMU approval has changed. The Department believes that additional scrutiny of the CAMU Phase 2 design including the leachate system, liner system, and post-closure issues is warranted. 40 CFR 264.551(d) requires that Asarco provide sufficient information to enable EPA to designate a CAMU according to the criteria in 40 CFR 264.552.

40 CFR 264.551(e) requires EPA to specify in the order the requirements for the CAMU. The Department believes that since this was not done, the Department and EPA must evaluate the design and require the CAMU meet standards pursuant to relevant regulations and guidance including, but not limited to, 40 CFR 264.551, 40 CFR 552, 40 CFR 264 Subparts F, G, and N, and 40 CFR 258.

The Department was not able to complete a detailed technical review of the design calculations in Appendix C due to limited staff resources. The Department encourages EPA to have a qualified person review the design analysis provided in Appendix C prior to approval of the CAMU.

The Department has further reviewed the Design Analysis Report and the additional documents. To assist EPA, the Department has incorporated in this letter our initial comments from the February 14, 2007 letter with some revisions. The Department's comments are listed below:

CAMU Phase 2 Design

1. Since the CAMU will be the final storage and disposal location for hazardous waste, the Asarco must consider 40 CFR 264.18 *Location standards*. 40 CFR 264.18 specifies seismic considerations that require compliance demonstration pursuant to 40 CFR 270.14(b)(11). Asarco must provide additional information to demonstrate compliance with this standard.

   In addition, Asarco is required under 40 CFR 264.301(c)(1)(ii) that the liner be constructed of material that have sufficient strength and thickness to prevent failure due to pressure gradients. Language in the solid waste regulations more clearly explains seismic requirements. 40 CFR 258.14(a) requires all containment structures, including liners, leachate collection systems, and surface water control systems, be designed to resist the maximum horizontal acceleration in lithified earth material for the site.

   Asarco must demonstrate to EPA that engineering measures have been incorporated into the cell's design to ensure that the integrity of the structural components of the landfill unit will not be disrupted. The design should include seismic stability studies for designing the failure along the critical liner interface and for the cap cover stability over the geomembrane.

2. **2.3 Leachate Collection and Removal System** cites 40 CFR 265.301(c)(2) and (c)(3) as design performance standards. This citation is incorrect and should be 40 CFR 264.301(c)(2) and (c)(3)

3. **2.3 Leachate Collection and Removal System:** Asarco states that the leachate collection and removal system shall be constructed with a bottom slope of one percent or more. Asarco states that the CAMU Phase 2 Cell is designed to comply with the Administrative Rules of Montana (ARM) 17.50.506. ARM 17.50.506(6)(b) states that a leachate collection and removal system must be designed and constructed to ensure that the minimum slope at the base of the overlying leachate collection layer is at least 2% and side slopes do not exceed 33% when a compacted soil liner or re-compacted natural lithology is used as the barrier layer. Asarco must clarify whether the design will comply with ARM 17.50.506(6)(b).

4. **3.1 Site Selection:** cites "Montana DEQ siting guidance." Asarco must include in the report the specific name of this guidance.

5. **3.4 Soil Materials:** Asarco cites that material specifications for the compact clay liner have been written to prevent soil particles greater than 1 or 2 inches from being used to construct the liner. The Department recommends that EPA limit soil particle size to less than or equal to 1 inch.

6. **3.5 Waste Material:** The Department understands that Asarco will be disposing of asbestos in the CAMU Phase 2 Cell. Asbestos regulations require specific management practices. Asarco must clarify whether asbestos containing material will be disposed in a separate cell within the CAMU Phase 2 Cell. Asarco must comply with the Department's *Montana Asbestos Work Practices and Procedures Manual*. Asarco must include in the work plan a description of how asbestos will be managed; simply citing the applicable regulations is inadequate.

7. **3.5 Waste Material:** Asarco should identify the waste material intended for disposal in the CAMU that Asarco suspects may be of extreme pH that will require neutralization.

8. **Table 3-3 Major Demolition Debris Waste Material Quantities:** The table includes 2000 cubic yards from "Excavation for Plant Cap." It is not clear to the Department the meaning of this category

since a final site remedy has not been approved by EPA. The Department's approval of the CAMU Phase 2 Cell plan does not constitute approval of any plant cap.

9. **Table 3-3 Major Demolition Debris Waste Material Quantities:** The table includes a category "Remediation of Property for Chemet." Asarco must explain this category that is slated to generate 5000 cubic yards of waste.

10. **Table 3-3 Major Demolition Debris Waste Material Quantities:** The table includes a category "Sanitary Treatment." Asarco must explain this category.

11. **Table 3-3 Major Demolition Debris Waste Material Quantities:** The table list "HDS water treatment." Asarco should be reminded that a final remedy has not been selected for this site and corrective action may not be completed by 2009. Asarco may be required to treat groundwater purged from sampling and may be required to treat storm water.

12. **3.5 Soil Materials:** The initial clay liner of the CAMU Phase 1 Cell was rejected by EPA because Asarco was not able to meet the compact clay liner specifications requiring no cobbles and rock fragments having a maximum dimension of 2-inches. A screening plant was required to sort and screen the native material to achieve this standard. The Phase 2 Design Analysis Report does not discuss a screening plant for construction of the CAMU Phase 2 Cell. Asarco must explain how Asarco intends to meet the Phase 2 specifications for the compact clay liner without screening.

13. **3.5 Component Design:** This section states that the landfill has been designed and constructed pursuant to EPA and Department guidance. However, 8.0 References does not reference any Department guidance. Please specify the Department guidance that Asarco is using.

14. **3.5 Component Design:** Section 5.0 of the CAMU Phase 1 design report specified a two feet protective layer adjacent to the bottom and sides of the cell. EPA should require that Asarco include a two feet protective layer over the primary liner in the CAMU Phase 2 design. The two feet protective layer must include 12 inches of ¼ to ½ inch size material on the bottom. This two feet protective layer may include 12 inches or more of ¼ to ½ inch size gravel layer used for leachate management. If soil is used as part of the protective layer, the soil may not impede the movement of leachate. The two feet protective layer must be free of oversized material and sharp objects.

15. **3.5 Component Design:** The design report must be updated to include additional information on the proposed cap including the GCL. The geosynthetic clay liner should be needle punch reinforced GCL comprised of a uniform layer of granular sodium bentonite encapsulated between a scrim reinforced non-woven and a virgin staple fiber non-woven geotextile. The needle punched fibers should be thermally fused to the scrim reinforced non-woven geotextile to enhance the reinforcing bond. All seams must be overlapped a minimum of 12 inches and sealed with powdered bentonite sealing compound. Seams must be oriented parallel to the line of maximum slope. No horizontal seams should be allowed on the slopes.

    Appendix G should be modified to include the specification requirements for the GCL and conformance testing. If a test result is in non-conformance, all material from the lot represented by the failing test should be considered out of specification and rejected.

16. **3.5 Component Design:** The design analysis report does not include information on a gas collection and removal system. Asarco must include additional information including design specifications and drawings. A 6 inch gas migration layer is proposed. The Department recommends that the top of the waste be covered with at least 12 inches of material to ensure protection of the cap. The waste layer

should be smoothed prior to the gas migration layer being applied to ensure that all protuberances are adequately covered.

17. **3.5 Component Design:** Frost protection of the liners is very important. Therefore, in the event that Asarco is not able to load the cell to grade as planned, Asarco must maintain a 2 feet layer of gravel or other approved material over the bottom and side walls of the cell.

18. **3.5.1.1 Primary Flexible Membrane Liner (FML) and 3.5.1.2 Secondary Composite Liner:** To ensure a stable interface with the clay and geonet, Asarco must use a 60 mil double-sided textured HDPE. In addition, the HDPE must have no factory seams.

19. **3.5.1.3 Cap Composite Liner:** To improve stability, Asarco must use a 40 mil double-sided textured HDPE for the cap liner. The Department recommends that a geocomposite be used between the liner and the 12 inch drainage layer, especially on the cap slopes, to prevent sloughing.

20. **3.5.2 Leachate Systems:** Asarco states that the HELP 3 model indicated the designed leachate collection system capacity will be exceeded during a 25-year, 24-hour storm when the fill in the cell is less than 60 inches. The design work plan stated that during construction, the construction contractor will be required to have pumps ready in case of a significant rainfall event. The Department received through the Department's attorney an electronic copy of the *Bid Solicitation and Construction Documents, 2007 Cleaning & Demolition Project and CAMU, Phase 2 Cell Project.* This document was not submitted to the Department by Asarco for review and comment. The bid document does not include the requirement that the contractor have on-site pumps to manage water in the event of a storm. Asarco must clarify how water from a storm event prior to final closure of the CAMU will be managed.

21. **3.5.2.1 Primary Leachate Collection and Removal (PLCR) System and 3.5.2.2 Leak Detection, Collection, and Removal (LDCR) System:** Asarco's PLCR and LDCR design includes a geonet layer. For better leachate collection and drainage, additional liner protection, and seismic stability, the Department strongly encourages Asarco to use a geo-composite drainage laminate. The geo-composite drainage laminate must be comprised of an 8 oz non-woven geotextile below and above a geonet.

22. **4.0 Placement of Waste Soils, Sediments and Demolition Debris in Cell:** The design report must specify the size of the waste lifts and the placement of the waste.

23. **4.0 Placement of Waste Soils, Sediments and Demolition Debris in Cell:** Asarco indicates in the report that concrete and brick will be crushed on-site to 3/8 inch minus. Asarco has not provided further detail on the equipment to be used, the location of this activity, or how waste will be handled. Treatment of hazardous waste in this manner triggers the applicability of additional requirements which are not identified in the report.

    Large quantity generators may treat hazardous waste on site without a permit provided they are in compliance with the applicable provisions in 40 CFR 262.34 and provided that the treatment is not thermal treatment. The Department assumes that Asarco intends to have equipment on-site that can size the concrete and brick. This activity would likely involve a crusher, conveyors, and staging piles of the waste. A crusher and other mixing and handling equipment would not likely be considered a tank or container because they are not designed to contain an accumulation of hazardous waste. EPA guidance states that if a unit would contain any waste, including a free-flowing liquid, it is a tank (Faxback 12899). Therefore, this operation would not qualify under the exclusion of 40 CFR 264.34 or be "permitted" as a temporary unit pursuant to 40 CFR 264.553.

Since EPA considers the concrete and brick remediation waste, 40 CFR 264.554 staging piles may be applicable. 40 CFR 264.554 states that storage includes mixing, sizing, blending or other similar physical operations to prepare waste for subsequent management or treatment. 67 FR 2997 specifies that more significant treatment operation involving something other than physical treatment – that is, where the chemical character of the waste is changed through chemical or biological treatment do not fall into the staging pile regulations. Based on the Departments assumptions on how the concrete and brick would be sized, the staging pile regulations would likely apply.

The concrete and brick (remediation waste) might also be managed under the CAMU regulations; however, the proposed activity would not be the same activity and design previously approved. The currently approved CAMUs are land disposal units not treatment units. Therefore, the unit would be subject to 40 CFR 264.552 and would likely require an opportunity for the public to review and comment on the plan. Managing this issue under 40 CFR 264.552 would require further evaluation to determine if the treated waste would be subject to treatment standards prior to disposal in the grandfathered CAMU.

Asarco must include in the CAMU Phase 2 design report additional information on concrete and brick sizing. If the staging pile regulations are not applicable, it is possible that the activity would need to comply with 40 CFR 264 Subpart X Miscellaneous Units.

If Asarco contends that the concrete and brick is not a hazardous waste, Asarco must submit a sampling plan to adequately demonstrate that the material is non-hazardous. In addition, the implications of sizing any ACM containing material must be discussed by Asarco.

The Department believes that EPA would administratively manage a staging pile, Subpart X unit, or new CAMU under the existing Consent Order. The current CAMU was managed as an interim measure. EPA would require Asarco to submit information to ensure compliance with the applicable standards and set conditions.

The Department believes that since a staging pile or Subpart X unit was not included in the Phase 1 CAMU, EPA would be obligated to seek public comment if they were used.

24. Asarco should provide a more detailed construction schedule similar to Figure 4-1 Construction Schedule in the Phase 1 Design.

25. **Appendix G Construction Quality Assurance Plan:** All geomembranes including the primary and secondary liners must be tested to ensure conformity of the material used with the design (40 CFR 264.19(c)(iii)). Tables 5-1 and 6-1 list the parameters, test methods, test frequency and rejection criteria. The tables should include the parameter values and units that the conformance tests are evaluating. If a test result is in nonconformance, all material from the lot represented by the failing test should be considered out of specification and rejected.

Construction & Waste Management and Placement

26. **4.0 Placement of Waste Soils, Sediments and Demolition Debris in Cell:** Asarco states a dust control program will be required. Asarco must submit the dust control program to the Department prior to commencing construction of the CAMU.

27. **5.0 Temporary Closure and Monitoring - Appendix E Operation and Maintenance Plan:** This appendix includes an operation and maintenance plan for the temporary cap and post-closure care

monitoring of the CAMU. Section 3.3 Site Inspection states that a technical inspection will be performed no less than every five years. The section discusses informal inspection to be conducted no less than once a month. The Department believes that formal inspections once every five years is insufficient. The Department recommends that the landfill be inspected twice a year. The inspections should evaluate settling and subsidence, erosion, membrane liner damage, and the cap's vegetation. Asarco must document the inspections and any corrective action taken. The reports should be submitted to EPA in an annual report. Significant issues should be reported promptly to the EPA. The plan should be updated to include these additional inspection and reporting requirements.

Post-Closure Care

28. Asarco must include in the post-closure plan (such as Appendix D or E), a leak detection monitoring equivalent to 40 CFR 264.303(c).

29. **3.5.5 Groundwater Monitoring System – Appendix D Sampling and Monitoring Plan**

    a. 5.0 Sample Handling and Analysis: The parameter list proposed in Table 5-2 is inadequate. The parameter list must include all constituents that may be a source from the waste. The list must be expanded to include: arsenic aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, tin, vanadium, and zinc. The detection limits must be low enough to allow comparison to DEQ-7 standards.

    b. 6.2 Data Reporting: Asarco must include with each semiannual data submittal a table of the unique sample numbers and the corresponding sample location.

    c. 6.2 Data Reporting: Asarco must include with each annual groundwater monitoring report a potentiometric contour map.

    d. 6.2 Data Reporting: Asarco must include a concentration contour map of any detected analytes with each semiannual report.

    e. 6.3 Monitoring Program Review: The Plan does not adequately address steps for compliance monitoring or corrective action if a statistically significant increase in ground water is noted. In addition, the Plan does not include procedures for prompt notification of EPA. Asarco must revise the Plan to address these deficiencies. The Department suggest Asarco refer to 40 CFR 264 Subpart F including 40 CFR 264.98 through 264.100.

EPA Approval Conditions

The Department recommends that EPA's approval of the CAMU Phase 2 design include the following conditions:

I. EPA should specify that Asarco is prohibited from placing bulk or non-containerized liquid hazardous waste or free liquids contained in hazardous waste in the CAMU. Asarco should also be prohibited from placing any liquid which is not a hazardous waste in the CAMU; this prohibition would not include liquid used for dust control measures under an approved EPA plan.

II. EPA's approval of the CAMU should specify that the 2007 demolition order should facilitate installation of the Dross/Spiess Area slurry wall.

III. The Department reviewed some of the EPA and Department oversight inspections conducted during construction of the CAMU Phase 1 Cell. The inspection reports indicate that the design in the bid package used by the construction contractors was different than the Phase 1 Cell design approved by EPA. Therefore, EPA should remind Asarco in the CAMU approval letter that Asarco is responsible for ensuring that construction personnel are familiar with the EPA approved design.

IV. Asarco states in Section 2.9 Closure Certification and Post Closure Care of the CAMU design report that the post-closure period of the CAMU will be indefinite. EPA should clarify the post-closure care time period for the CAMU. The Department recommends that at least 30 years be specified following closure and that Asarco be required to follow the requirements of 40 CFR 264 Subpart G.

V. EPA's approval must include a requirement for Asarco to submit a final construction report for the CAMU Phase 2 Cell.

If you have any question regarding this letter, please contact me at phone number (406) 444-3983 or the e-mail address below.

Sincerely,

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cc: facility file – Asarco, Corrective Action